Electronically Trimmable Capacitor

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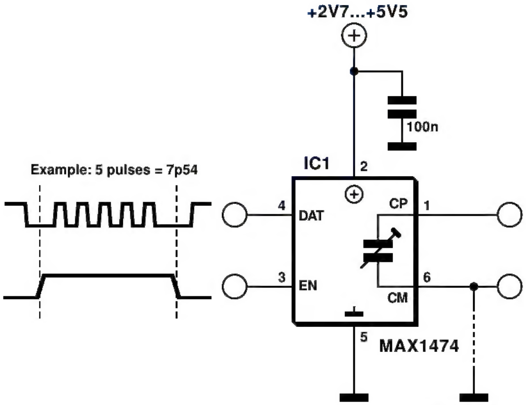

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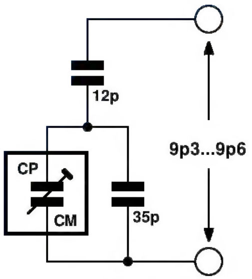

Q enhancement circuit

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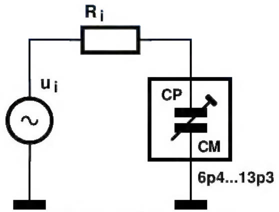

single ended

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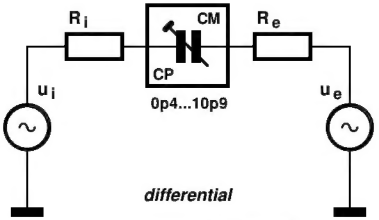

differential

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Maxim (www.maxim-ic.com) have recently introduced an innovative IC the MAX1474 also called a FLECAP (Fine Line Electronically trimmable Capacitor). This device is basically a capacitor that can be electronically adjusted through the range of 6.4 pF to 13.3 pF in steps of 0.22 pF and is supplied as a tiny SC70 outline package. Capacitor adjustment is performed by sending a series of pulses to the DAT input while holding the EN input high. The number of pulses (up to a maximum of 31) are counted and latched into an in internal register on the falling edge of the EN input. At power-up with no pulses sent, the capacitance would be 6.4 pF in a single-ended application or 0.42 pF in a differential application.

DC voltage at the variable capacitance pins must be within the chip supply voltage and the signal swing can be up to 300 mV either side of V_{DD} and V_{SS}. For optimum performance it is recommended to connect the CM capacitor pin to the lowest impedance node in your application (ground or supply if possible).

An internal multiplexer introduces a series resistance with the trimmable capacitor elements and this leads to a relatively poor quality (Q) factor of the capacitor. The diagram shows a method of enhancing the Q factor with fixed capacitors this will however reduce the range of the FLECAP.

One major application for this device will be to replace the variable trimmers usually necessary in quartz oscillator circuits. To increase capacitance range several FLECAP's can of course be connected in parallel or series.

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